

## CLAIMS

What is claimed is:

1. In a refrigeration system including a plurality of circuits and a compressor rack, an apparatus comprising:

an evaporator pressure regulator in communication with one of the plurality of circuits; and

a sensor in communication with said one of the plurality of circuits and operable to measure a parameter thereof;

said controller operable to adaptively control a suction pressure of the compressor rack based upon said measured parameter, wherein said controller controls a circuit temperature for said one of the plurality of circuits.

2. The system of Claim 1, wherein said controller further controls said evaporator pressure regulator based on said adaptive control of said suction pressure of the compressor rack.

3. The system of Claim 1, wherein said controller adaptively controls said suction pressure of the compressor rack until said evaporator pressure regulator is substantially one hundred percent open.

4. An apparatus comprising:

an electronic evaporator pressure regulator in communication with a refrigeration circuit and operable to control a temperature of said refrigeration circuit;

a sensor in communication with said refrigeration circuit and operable to measure a parameter from said circuit; and

a controller operable to control said evaporator pressure regulator based upon said measured parameter from said refrigeration circuit, wherein said controller adaptively controls a suction pressure for said refrigeration circuit.

5. The apparatus of Claim 4, wherein said controller further controls said evaporator pressure regulator based on said adaptive control of said suction pressure of the compressor rack.

6. The apparatus of Claim 4, wherein said controller adaptively controls said suction pressure of the compressor rack until said evaporator pressure regulator is substantially one hundred percent open.

7. In a refrigeration system including a plurality of circuits, an apparatus comprising:

an evaporator pressure regulator in communication with one of the plurality of circuits;

a sensor in communication with the one of a plurality of circuits and operable to measure a parameter thereof; and

a controller operable to control said electronic evaporator pressure regulator to control the temperature in said one of a plurality of circuits by determining a change in said parameter and updating a set point based upon the change in said parameter.

8. The system of Claim 7, wherein said electronic evaporator pressure regulator is substantially one hundred percent open.

9. The system of Claim 7, wherein said sensor in communication with the one of a plurality of circuits is operable to measure a refrigerant pressure.

10. The system of Claim 7, wherein said sensor measures temperature.

11. The system of Claim 10, wherein at least one of an average and a minimum/maximum of said temperature measurement is used for electronically controlling said evaporator pressure regulator.

12. The system of Claim 11, wherein said controller determines an error value between said at least one of an average and a minimum/maximum of said temperature measurement and a circuit temperature set point.

13. The system of Claim 12, wherein said controller determines a percent value opening for said evaporator pressure regulator based on said error value and electronically adjusts a valve position of said evaporator pressure regulator.

14. An apparatus comprising:

an electronic evaporator pressure regulator in communication with a refrigeration circuit and operable to control a temperature of said refrigeration circuit;

a sensor in communication with said refrigeration circuit and operable to measure a parameter from said circuit; and

a controller operable to control said electronic evaporator pressure regulator to control the temperature in said refrigeration circuit by determining a change in said parameter and updating a set point based upon the change in said parameter.

15. The apparatus of Claim 14, wherein said electronic evaporator pressure regulator is substantially one hundred percent open.

16. The apparatus of Claim 14, wherein said sensor in communication with the one of a plurality of circuits is operable to measure a refrigerant pressure.

17. The apparatus of Claim 14, wherein said sensor measures temperature.

18. The apparatus of Claim 17, wherein at least one of an average and a minimum/maximum of said temperature measurement is used for electronically controlling said evaporator pressure regulator.

19. The apparatus of Claim 18, wherein said controller determines an error value between said at least one of an average and a minimum/maximum of said temperature measurement and a circuit temperature set point.

20. The apparatus of Claim 19, wherein said controller determines a percent value opening for said evaporator pressure regulator based on said error value and electronically adjusts a valve position of said evaporator pressure regulator.

21. A method for refrigeration system control, comprising:  
operating an electronic evaporator pressure regulator to control a temperature of a refrigeration circuit;  
measuring a parameter from said circuit by a sensor in communication with said circuit; and  
controlling said electronic evaporator pressure regulator to control the temperature in said circuit by determining a change in said parameter and updating a set point based upon said change in said parameter.

22. The method of Claim 21, wherein said measuring a parameter from said circuit by said sensor includes measuring a refrigerant pressure.

23. The method of Claim 22, wherein said controlling includes controlling said evaporator pressure regulator based upon said refrigerant pressure measurement.

24. The method of Claim 21, wherein said measuring includes measuring temperature.

25. The method of Claim 24, wherein said controlling said electronic pressure regulator includes averaging said temperature measurement.

26. The method of Claim 25, further comprising determining an error value between said temperature measurement and a circuit temperature set point.

27. The method of Claim 26, further comprising determining a percent value opening for said evaporator pressure regulator based upon said error value and electronically adjusting a valve position of said evaporator pressure regulator.



28. A method for refrigeration system control, comprising:

operating an electronic evaporator pressure regulator to control a temperature of a refrigeration circuit;

measuring a parameter from said circuit by a sensor in communication with said circuit; and

adaptively controlling said electronic evaporator pressure regulator and a suction pressure based upon said measured parameter from said refrigeration circuit.

29. A method for refrigeration system control, comprising:
- operating an electronic evaporator pressure regulator to control a temperature of a refrigeration circuit;
  - measuring a parameter from said circuit by a sensor in communication with said circuit; and
  - controlling said electronic evaporator pressure regulator to control the temperature in said refrigeration circuit by adaptively controlling a suction pressure for said circuit.

30. A method for controlling a refrigeration system having a compressor rack and a plurality of circuits including a lead circuit, each circuit having at least one refrigeration case, the method comprising:

positioning an electronic evaporator pressure regulator in communication with each circuit;

positioning a sensor in communication with each circuit; and

providing a plurality of compressors forming a compressor rack;

wherein said electronic evaporator pressure regulator may be operated to control a temperature in the at least one refrigeration case by controlling each said electronic evaporator pressure regulator and adaptively controlling a suction pressure of said compressor rack based upon parameters measured by said sensors associated with each of said circuits.

31. A method for controlling a refrigeration system, comprising:

- positioning an electronic evaporator pressure regulator in communication with a refrigeration circuit;
- positioning a sensor in communication with said circuit; and
- communicating a compressor with said circuit;

wherein said electronic evaporator pressure regulator is operable to control a temperature in said circuit by controlling said electronic evaporator pressure regulator and adaptively controlling a suction pressure of said compressor based upon parameters measured by said sensor.

32. A method for controlling a refrigeration system, comprising:  
detecting a temperature or pressure value;  
comparing said detected value to a set point value; and  
updating an evaporator pressure regulator valve position for a refrigeration circuit based on said comparison to control the temperature in said refrigeration circuit.

33. The method of Claim 32, wherein said comparing includes PID control.

34. The method of Claim 32, wherein said comparing includes determining an error value and said updating includes adjusting a valve position of said evaporator pressure regulator.